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# Evidence for aboveground activity of Zambian Molerats (*Cryptomys*, Bathyergidae, Rodentia)

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By definition, subterranean mammals spend most of their lives in underground burrows, where they find their food and reproductive partners, and most of them come to the surface only incidentally. The physical and biotic uniqueness of subterranean ecotope (which is dark, stable, monotonous, hypoxic, hypercapnic, etc.) leads to an adaptive convergence at all levels of organizations (cf., e. g. Nevo and Reig 1990). Consequently these mammals have become unique subjects for studies of (among others) sensory biology and physiology of metabolism.

Particularly Zambian mole-rats of the genus *Cryptomys* (Bathyergidae, Rodentia) have been very intensively studied within the last decade concerning their hearing and acoustic communication (Credner et al. 1996), orientation in space (Burda et al. 1990; Lindenlaub et al. 1995), and physiology af metabolism (Marhold and Nagel 1995; Bennett et al. 1994).

While all these studies have elucidated interesting adaptations to an underground life style, they have been carried out in laboratories, and the central question remains as for how strictly are these animals confined to underground life. Do they also, incidentally or even regularly, come into contact with daylight, aboveground sensory cues or climate? There are only few direct (Genelly 1965; Oatley and Ansell 1966; Sheppe 1973) and indirect observations (e. g. skulls in owl pellets) indicating aboveground activity in mole-rats and related species (cf. De Graaff 1981).

During a six-months' field study in Zambia (April–October 1996) we found some indirect evidence that mole-rats of the genus *Cryptomys* spend more time outside the burrow system than generally assumed. We studied common mole-rats (*Cryptomys* spec., $2n = 68$) in Lusaka and giant mole-rats (*Cryptomys mechowi*) in Ndola. We excavated burrow systems in different areas and caught the animals. Although we never observed mole-rats aboveground, local people and mole-rat hunters reported on mole-rats moving on the surface particularly during early morning hours.

Altogether we excavated 12 nests. Three nests consisted completely of plastic material (nylon stockings, pieces of plastic bags, and sacks). Three further nests contained a mixture of plastic materials, dry grass and root fibres. These six nests were situated near cultivated fields and human buildings. The six remaining nests contained a mixture of grass and root fibres. They were situated far away from human settlements. It seemed that mole-rats preferred plastic materials (if available) to grass or roots. It is obvious that mole-rats must have collected most of their nest material aboveground.

In a food chamber of a colony near Lusaka we found two seeds of the tree *Parinaria curatellifolium* (Chrysobalanaceae). Also this finding indicates that mole-rats may even sometimes forage aboveground.

We found two small colonies of giant mole-rats (3 and 4 animals) in a "dambo" (a seasonally inundated area) near Ndola. Compared to normal habitats (e. g. cultivated fields), the burrow systems from dambos were small (50 $m^2$ versus >300 $m^2$). The burrow systems were surrounded by areas where the level of ground water was near or above the surface (at the end of the dry season), so it was impossible for the mole-rats to reach this area underground. Most probably a breeding pair reached the dambo aboveground and established a new colony. This is supported by the finding that both families consisted of two adult animals (male and female) and one or two subadult individuals. Normally, giant mole-rats live in large colonies of even about 40 animals.

These findings indicate that mole-rats of the genus *Cryptomys* obviously spend more time outside their burrows than assumed so far. Most of the aboveground activity occurs probably at night.

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